



Evaluation of the association between blood homocysteine concentration and the degree of behavioral symptoms in the 6-hydroxydopamine-induced Parkinsonism in rat



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ARTICLE INFO

Article history:

Received 9 January 2014

Received in revised form 1 June 2014

Accepted 22 June 2014

Available online 30 June 2014

Keywords:

Homocysteine

Parkinson's disease

6-Hydroxydopamine

Apomorphine-induced rotational test

Cell replacement therapy

B vitamin supplementation

ABSTRACT

Growing evidence indicates that homocysteine (Hcy) may be involved in the pathophysiology of several neurological disorders including Parkinson's disease. In the present study, the association between blood Hcy concentration and the degree of behavioral symptoms in the 6-hydroxydopamine (6-OHDA)-induced Parkinsonism in rat was evaluated. Total serum Hcy (tHcy) was measured before and 6 weeks after the intracerebral injection of 6-OHDA. Apomorphine-induced rotational test was performed at second, third and sixth weeks after 6-OHDA injection. Subsequently, cell replacement therapy was performed on rats with good rotation score. No correlation between tHcy in before 6-OHDA injection and severity of the rotations after 6-OHDA injection was observed. On the other hand, 6-OHDA treatment significantly decreased tHcy level. However, this reduction was only observed in animals with low degree of rotations and in rats with high number of rotations; tHcy did not change significantly. Furthermore, 10 weeks after cell transplantation, tHcy was significantly lower than that found before therapy if the rats showed good improvement in the degree of rotations. We also examined the effect of different supplements of B vitamins on tHcy before and after 6-OHDA injection. In healthy rats, all kinds of B vitamins and also supplement B6 or B12 alone reduced tHcy. Following 6-OHDA injection, B vitamin supplementation failed to cause remarkable effect. Considering the direct correlation between the severity of rotational behavior and the degree of lesion in the substantia nigra (SN), our data indicate that higher tHcy values can predict higher SN dopaminergic neurodegeneration.

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